Nurein Umeya

📧: nurein.umeya@mail.utoronto.ca Github: https://github.com/cl0udsw1tch Portfolio: https://cl0udsw1tch.github.io/portfolio
📞: 647-570-9128

Roboticist and developer, I have extensive knowledge in the fields of robotics, software engineering, and state-estimation (SLAM-based methods). As a second hat I'm a full-stack developer who uses the REST design methodology between a React/React-native front-end and a NodeJS backend.

Experience

LeddarTech Sept 2023 – May 2024

Software Engineer Intern **(C++, bash, CMake, Git, GDB, CI/CD)**

- Helped build road lane detection in a computer vision application for motor vehicles.
- Used C++, bash, CMake, Git, GDB, CI/CD tooling in bitbucket, and developed in a **Linux** environment.
- Extensive profiling, optimizing, and rewriting of code to achieve **15 frames of processing a second** in embedded Nvidia devices.
- Worked in a **high pace AGILE environment**, frequently completing sprints.
- Performed code review for colleagues.

University of Toronto Sept 2021 – May 2022

Math TA

- Teaching assistant for 1st and 2nd year **linear algebra, multivariable calculus** and **vector calculus (4 courses across 2 semesters)**
- Taught lessons, graded assignments/tests, and tutored students after-hours.

Projects

AI TCP [AI Time Complexity Predictor] **(Java, Python, Pytorch)**

- A Java preprocessor using the **Javaparser library** to iterate and replace parsed nodes in Java source code strings with custom tokens
- A PyTorch **LSTM model** with a custom tokenizer to tokenize source code strings, with a classifier to classify time complexity into 7 distinct classes
- Achieved **80% accuracy** on unseen Java strings despite a **small (~4000 sample) dataset**.
- A VSCode extension for users to highlight source code and get a time complexity prediction. Build with the developer in mind to help produce more efficient code and find inefficiencies faster

Blockchain **(Golang, SQLite)**

- A layer one proof of work blockchain implemented from scratch, with a **CLI and JSON RPC**
- Objects such as blocks, transactions etc. use specific **serialization/deserialization** formats to exchange bytes between processes running nodes.
- Includes a **stack-based interpreter** module to run opcodes for verifying transaction signatures (like Bitcoin)

Ember **(C++)**

- Ember is a C++ library focused on providing essential data structures for use in graph-related algorithms and other utilities. Includes algorithms on sequences, **graph traversal algorithms** etc.

AIM [AI Manipulator] **(C++, Python)**

- C++ graphics via **OpenGL** with a custom Blender model.
- **Custom built CNN** for classifying hand signs (achieved **test accuracy of 93%**)
- **IPC** used to manipulate the model via webcam input processed by the CNN

WDI App **(React, HTML+CSS+TS, Flask + Python, D3.js)** (https://wdi-app.cloudswitch.ca)

- Web app displaying **10s of thousands of development indicators** for each country by year collected by the World Bank, using their API.

Skills

ROS, Robotics, State Estimation, C, C++, Bash, Typescript, React, Docker, Gitlab CI/CD, Solidity, Golang, PHP, SQL, Git, Python, MATLAB, Make, CMake, React-native, NextJS, Svelte and SvelteKit, NodeJS, HTML, CSS, Pandas, Numpy, PyTorch, ExpressJS, AWS, GCP, Azure, Spark, Hadoop, JQuery, Spring (Java), C#, F#, .NET

Education

University of Toronto

Master's of Engineering, Mechanical **(*Robotics & Machine Learning/Data Science*)** January 2023 – April 2025

- Knowledge base: Path Planning, Perception, Data-science, Machine Learning, Computational Fluid Dynamics, State Estimation, Robotics

Bachelor of Science September 2017 - April 2022

- Neuroscience Major, Physiology Major, Mathematics Minor
- 3.82 GPA

Associations

University of Toronto

- Neuroscience Association For UofT Students (NAUS) September 2020 - April 2021
  - Helped with outreach, organizing events, including a talk on backpropogation by Nobel Laureate Goeffrey Hinton